# RESPONSE TO COMMENTS FROM THE U.S. ENVIRONMENTAL PROTECTION AGENCY ON THE 1999 ANNUAL REPORT, MONITORING EVENTS 14 AND 15 SITES 1 AND 3 AND EASTERN PLUME NAVAL AIR STATION, BRUNSWICK, MAINE

**COMMENTOR: Michael Barry** **DATED: 18 April 2000**

Thank you for the opportunity to review the above report. Upon our review and per the technical meeting on 11 April 2000, we have the following comments. To aid in response, comments are coded as below. General and specific comments have been combined and are in chronological order.

(RR) Response requested.

(NR) No response required, usually an observation/note or issue expected to be overcome by events.

(ED) Means editorial comment or suspected typographical/format error.

(MTG) Means comment should be discussed prior to response. All were discussed at the 11 April meeting.

This year's report was markedly improved from last year's; we greatly appreciate the effort you and EA Engineering, Science, and Technology put into the report preparation.

1. (NR/MTG). Another explanation for similar VOC concentrations at EW-1 and MW-229A is that higher VOCs from the deep EW-1 screen (11 to -67 ft MSL) are being diluted by a large pull from the shallow aquifer to the level of VOCs in the 36-ft shallower screened MW-229A. Also, all things being equal dilution, similar to that of EW-5 and P-106 would be expected. This was discussed at the meeting; we may have misinterpreted the draft text. Also, we think future work in the southern boundary area will shed more light on this. Page 3-1 refers.

   ***Response***—This issue was discussed at the 11 April 2000 Technical Meeting. This statement was intended to note that the relative amount of dilution for EW-1 is believed to be lower than for other extraction wells. This sentence has been revised as follows:

   *This similarity in total VOC concentrations suggests the deep ground water being withdrawn by EW-1 is diluted by ground water extracted from the shallow interval to a lesser degree than at other extraction wells.*

2. (RR/MTG). Cross sections C-C' and C-CC' from the RI showed that shallow ground water does flow north from the area south of Mere Brook, but that the deep system continues to flow in the regional southern direction. This was discussed at the meeting and future work on the southern boundary should provide more information. Because the figures are interpretive,

EPA will not argue to change the deep gradients for this report. However, we urge the Navy to consider this in future reports. Our belief in the prevalence of regional southerly flow is also key to our concern that VOCs could be flowing south through gaps in the network. Page 3-3, Sect 3.2.1 refers.

***Response***—This issue was discussed at the 11 April 2000 Technical Meeting. Upcoming work along the southern boundary should provide valuable data to address this question, and the larger issue of whether VOCs may be present in ground water downgradient of the current boundary of the Eastern Plume. We do not feel there is sufficient information available to re-interpret deep flow patterns in the past, although current ground-water flow patterns summarized on potentiometric contour maps are believed to be accurate based on recently collected long-term monitoring data. As discussed during the Technical Meeting, additional well points are present now that were not present when the remedial investigation was completed (i.e., MW-333 and MW-334). In addition, the operation of the ground-water extraction system since 1996 may have altered deep ground-water flow patterns compared to pre-1996 conditions. Therefore, we would look to discuss this issue further when additional data have been collected.

3. (ED). EW3 is off service (ref to draw down).

   ***Response***—Noted, EW-3 is out of service. Revisions to appropriate paragraphs as noted in MEDEP's Comment No. 8b have been made.

4. (NR). We assume 1,1,1-TCA is not a commonly reported VOC above the MCL in the Eastern Plume because its MCL is two orders of magnitude higher, at 200 ppb. Page 3-6, Section 3.3.2.1 refers.

   ***Response***—No response required.

5. (NR/MTG). We believe primary VOC flow direction may actually be southwest rather than southeast because of being constrained by deep clay covered bedrock rising in a southwest-northeast axis (MEDEP's GMS figures displayed this configuration well). A large amount of VOCs are/were being pulled to the southeast into the MW-311 "arm" EW-2A, EW-2, and artesian flow out through MW-311 in 1990-1995. However, VOCs were initially low in MW-311 during historical release period (1950s through the RI) and the deep wells put in on the southeast came up very low or ND, confirming this (MW-333/334). This, along with Comment Nos. 1 and 2, speak to our concerns about potential flow to the south. This was discussed at the meeting and we expect future work on the southern boundary will address this concern. Page 3-7, Section 3.3.2.1, third dash refers.

   ***Response***—This comment will be considered when planning future investigations along the southern boundary. We believe that contaminant distribution is likely to be greatly influenced by site geology, including the clay surface geometry. In addition, the spatial variability of the deep sand unit, and the degree of hydraulic connection of transmissive

intervals, are also likely to be very important factors to consider when discussing plume migration potential.

6. (NR/MTG). Landfill repairs. Please refer to EPA comments to repairs letter report for specific comments. Essentially, we concur with annual inspections/repair as necessary. It appears the cap was not constructed according to design in all aspects, especially the drainage structures. This may result in more repairs and maintenance than expected over the life of the cap. A mitigating factor at Sites 1 and 3 is the relatively flat slope, thus this appears to be more a recurring maintenance cost than a remedy protectiveness concern. As discussed at the meeting, we believe the current inspection and maintenance program is effective and appropriate. Top of Page 3-12 refers.

   ***Response***—No response is required.

7. (NR). Diffusion samplers have the potential to provide additional vertical profiling information in addition to providing results comparable to low flow at much reduced cost. Vertical placement seems to be the critical factor. We commend the Navy on proactively studying diffusers, look forward to the next trial results, and await a proposal for their formal use. Section 3.6.1 refers.

   ***Response***—No response is required. As discussed at the 12 April 2000 RAB meeting, diffusion samplers were included in the April 2000 long-term monitoring event at selected wells and with three samplers per well (approximately placed at the top and middle of the well screen and at the pump intake). Results will be included in a letter report, and briefly summarized in the Monitoring Event 16 Report.

8. (NR). Section 3.6.2, Seep-04. Another idea would be to use liquid diffusers before installing a well and/or using a temporary or micro well. This might obtain good data and save some funds.

   ***Response***—Comment noted; we agree this is a way to save funds. No response is required.

9. (NR/MTG). Section 3.6.3, new extraction wells. A new, deep screened EW-5 is obvious. Perhaps the second deep screened extraction well might be more optimally placed further south, near EW1, especially if some time and effort will be spent to optimize location? Probing in the immediate area around EW-5 seems reasonable as a lot is known about that area. This was generally discussed at the meeting with no formal resolution.

   ***Response***—EW-4 is being considered for re-screening rather than EW-1 because samples from it have had consistently detected higher concentrations of VOCs. Therefore, EW-4 will be re-installed to maximize VOC removal from the Eastern Plume. The proposed new extraction wells are located and the screened interval determined the information will be presented to the U.S. EPA and MEDEP for discussion, along with proposed well locations and screened intervals. Currently, the Navy is evaluating and determining the appropriate investigation method(s) to locate the new extraction wells.

10. (NR/MTG). Section 3.6.4, last bullet. Significant probing would be required to resolve the potential preferential flowpath to the south-southwest. Because of the relatively large area and small size of potential pathways the cost of active probing the entire area may become quite high. We think seismic reflection is best suited to this task, but perhaps a synergy of seismic methods (perhaps less accurate and cheaper) and probing would be most optimal? This was generally discussed at the meeting and it's our understanding the Navy is going to undertake some seismic reflection work.

    ***Response***—A strategy for further investigation along the southern boundary is being formulated. This may include a combination of several investigative methods including a combination of seismic refraction and probing.

11. (NR). The TCE, PCE, and 111-TCA figures were interesting and complimented the gradient and total VOC figures in the event reports well.

    ***Response***—The EPA's positive response is appreciated.

12. (ED). The "bullseye" charts at Appendix A.1 and A.2 are interesting but are all or nothing. For next year, the Navy might consider using three or four colors (100, 500, or 1,000 ppb VOCs). This would display progress over the range of VOCs we have seen. In later years, as MCLs are approached, just using above and below the MCL is more important.

    ***Response***—The recommended revision of the "bullseye" charts will be evaluated for future reports.

13. (ED). Figures 3-1, 3-2, 3-3, and 3-4 have a dashed line for the "one plume" inferred above MEG/MCL and also has shaded areas for the "two lobes" inferred above the MCL/MEG. We concurred on the one plume version.

    ***Response***—Figures 3-1, 3-2, 3-3, and 3-4 do not have the "one plume" or the "two lobes" shown on the figures. Figures 2-2, 2-3, and 2-4 do have these; however, the "one lobe" is representative of the "approximate limits of Eastern Plume in 1999 based upon VOC detections" and the "two lobes" represent areas that are "inferred extent of Eastern Plume above MEG/MCL."

14. (NR). The figures on Pages 2-1, 2-2, and 2-3 are a welcome relief from having to page back and forth from text to figures.

    ***Response***— The EPA's positive response is appreciated.

15. (NR). For the final report, we recommend only shipping out new text pages to save reprinting all the color graphs and figures unless something changes.

    ***Response***—No response required.

COMMENT TABLE

| Number | RR | ED | NR | MTG | Refers to |
|---|---|---|---|---|---|
| 1 | | | X | X | EW-1 and MW-229A VOCs |
| 2 | X | | | X | Deep gradients south of Mere Brook |
| 3 | | X | | | EW-3 reference |
| 4 | | | X | | 1,1,1-TCA |
| 5 | | | X | X | Plume flow direction southwest |
| 6 | | | X | X | Landfill repairs |
| 7 | | | X | | Diffusers |
| 8 | | | X | | Seep-04, new monitoring well |
| 9 | | | X | X | New extraction wells |
| 10 | | | X | X | Interface probes vs. seismic reflection in south |
| 11 | | | X | | VOC figures |
| 12 | | | X | | "Bullseye" charts |
| 13 | | X | | | Area above MCL on figures |
| 14 | | | X | | Figures on Pages 2-1, 2-2, and 2-3 |
| 15 | | | X | | Revision to draft report |